

CLAIMS

1. An air conditioning system for an aircraft, in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least one expansion turbine over which warm pressurised air is expanded and cooled, and further includes a heat load exchanger in which a heat load from hot cabin air is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine; and wherein there is a condenser heat exchanger in which recirculating cabin air is brought into heat exchange relationship with the warm pressurised air to cool and promote water removal therefrom prior to its being expanded by the expansion turbine.

2. A system according to claim 1 wherein the recirculating cabin air is passed through the condenser heat exchanger after it has been passed through the load heat exchanger.

3. A system according to claim 1 wherein the recirculating cabin air is passed through the condenser heat exchanger before it passes through the load heat exchanger.

4. A system according to claim 1 which is selectively operable in a first mode in which the recirculating cabin air is passed through the condenser heat exchanger after it has been passed through the load heat exchanger and in a second mode in which the recirculating cabin air is passed through the condenser heat exchanger before it passes through the load heat exchanger.

5. A system according to claim 1 wherein water removed from the warm pressurised air in the condenser heat exchanger is used to assist in cooling of engine bleed air supplied to the system.

6. A method of operating an air conditioning system in an aircraft of the kind in which cabin air is recirculated and mixed with cold air from an air conditioning machine which includes at least one expansion turbine over which warm pressurised air is expanded and cooled, and wherein the system includes a load heat exchanger in which a heat load from hot cabin air is exchanged with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine; the method including bringing recirculating cabin air into heat exchange relationship with the warm pressurised air prior to the pressurised air being expanded by the expansion turbine, to cool and assist in removing water from the warm pressurised air.

7. A method according to claim 6 wherein the recirculating cabin air is brought into heat exchange relationship with the warm pressurised air after the cabin air has passed through the load heat exchanger.

8. A method according to claim 6 wherein the recirculating cabin air is brought into heat exchange relationship with the warm pressurised air before the cabin air is passed through the load heat exchanger.